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(58) Field of Search

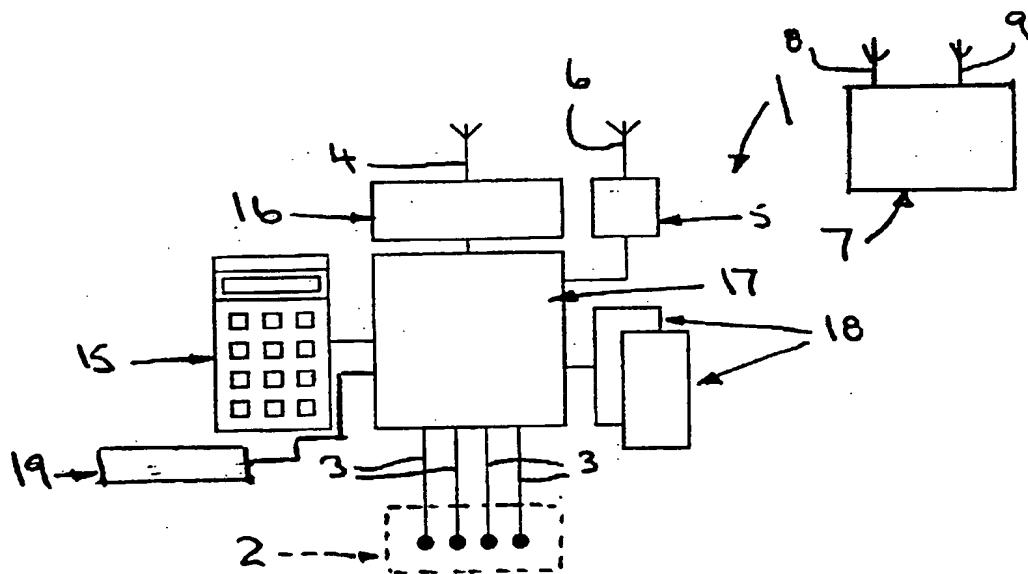
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Online Databases: WPI, EPODOC, JAPIO

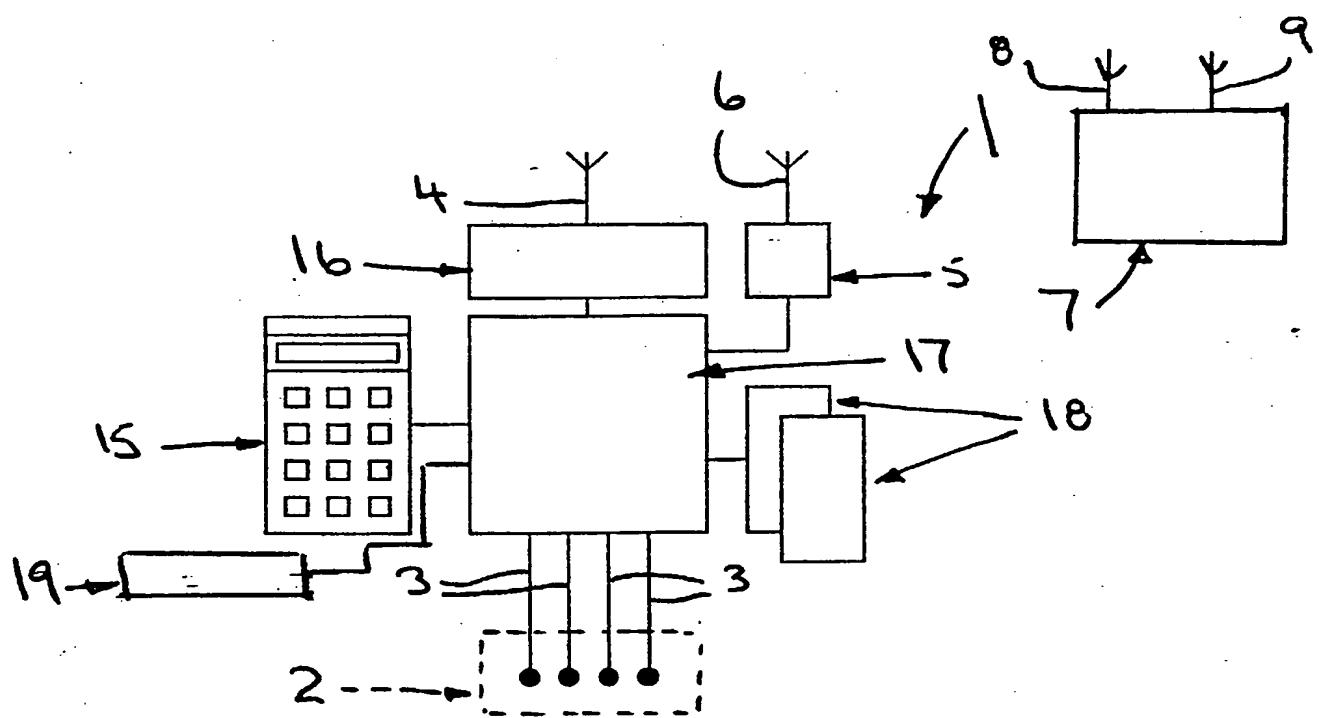
(54) Abstract Title

Temperature and position data transmitting apparatus

(57) A transportable apparatus 1 comprises at least one temperature sensor probe 3 for sensing the temperature of cargo 2, and a GPS (Global Positioning System) 5 for establishing the position of the apparatus. The sensed temperature and position information is transmitted by radio signals from an antenna 6 to a ground based receiving station 7. The apparatus may be mounted in a road vehicle, aircraft or marine craft for monitoring the temperature of perishable goods. The apparatus also comprises an operator display, keypad and on-board printer.



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TEMPERATURE DATA TRANSMITTING APPARATUS

5 This invention relates to temperature data transmitting apparatus and provides such apparatus which is transportable and which can transmit radio signals which correspond to said temperature data and also radio signals which correspond to the position of the apparatus.

10 According to the invention, transportable apparatus for transmitting temperature data and for transmitting apparatus position data, comprises at least one temperature sensor for sensing temperature of a body in the proximity of the apparatus, means for transmitting radio signals corresponding to temperature so sensed g.p.s. (Global positioning system) means for establishing the position of the apparatus, and means for transmitting radio signals corresponding to apparatus-position data provided by said g.p.s. means.

15 An embodiment of the invention will now be described by way of example only, with reference to the accompanying schematic drawing.

20 With reference to the drawing, transportable temperature data transmitting apparatus 1 for transmitting temperature data obtained from a body 2 and means including a radio communication set 16 for transmitting apparatus position data is shown. The apparatus 1 comprises at least one temperature-sensing probe 3 for sensing temperature of the body 2 and for transmitting radio signals by way of antenna 4, corresponding to temperature so sensed.

25 Four temperature-sensing probes 3 are incorporated on the apparatus 1. The body 2 represents, in this example, a cargo of perishable goods. The goods are transported by vehicle, (not shown), which carries the apparatus 1. The vehicle may comprise a road vehicle, an aircraft, or a marine craft. In fact, any convenient form of transporter.

30 The apparatus 1 further comprises g.p.s. (Global positioning system) means employing a g.p.s. unit 5 provided with an antenna 6. The g.p.s. unit 5 uses a system of satellites

whereby an accurate estimate is made of the position of the apparatus 1 on or near the earth's surface, or above it, if carried by an aircraft.

5       The antenna 4 provides means for transmitting, to a ground-based receiving station 7, radio signals corresponding to apparatus position data provided by the g.p.s. unit 5.

The receiving station 7 is provided with antenna 8 for receiving radio signals emitted by antenna 4 of the apparatus 1, and for transmitting radio control signals to the apparatus.

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The apparatus 1 also comprises the following:-

- (a)      Operator display and keypad 15
- (b)      Radio communication set 16
- 15       (c)      Control processor 17
- (d)      Memory unit 18
- (e)      On-board printer 19

20       The display and keypad 15 enables the apparatus 1 to be manually configured. For example, how often a temperature reading is to be obtained from probe 3.

The control processor 17 controls the operation of the apparatus 1 and executes the instructions contained in the program entered.

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The control processor 17 receives temperature-data signals from the probes 3 and electronically records and stores this information which can then be downloaded electronically, or onto printer 19, used for presenting information corresponding to the temperature sensed data. The tracking part of the apparatus 1 allows the position of the apparatus (and hence its transporter) to be monitored by receiving station 7.

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Position data is transmitted to the station 7 by way of antennas 4 and 8, which may employ cellular networks, satellite networks and other radio communication systems.

In a similar manner temperature data is transmitted to station 7, also using antennas 4 & 8.

The remote monitoring of temperature data is a particular-feature of this invention, as it obviates any need to down load or take print-outs. Thus the invention provides real-time monitoring of temperature in remote situations, when, for example, no transport driver is able to monitor temperature conditions. The apparatus 1 records and stores the position and temperature data, which can then be displayed over the Internet, if desired.

10 Combined aerials may be used instead of antennas 4 and 6.

Zeal Radio Data Systems of 8, Deer Park Road, London SW1, market a "Thermoprint 700", which is a temperature recorder suitable for incorporation in the apparatus 1.

## CLAIMS

1. Transportable apparatus for transmitting temperature data and for transmitting apparatus position data, comprising at least one temperature sensor for sensing temperatures of a body in the proximity of the apparatus means for transmitting radio signals corresponding to temperature so sensed, g.p.s. (Global positioning system) means for establishing the position of the apparatus, and means for transmitting radio signals corresponding to apparatus-position data provided by said g.p.s.
2. Apparatus as claimed in Claim 1, provided with means for programming the apparatus whereby temperature sensing is performed when required.
3. Apparatus as claimed in Claim 2 wherein said means for programming the apparatus comprise manually operated display and keypad means.
4. Apparatus as claimed in any one of Claims 1, 2 or 3, provided with control processor means for receiving temperature data information and electronically recording and storing said data.
5. Apparatus as claimed in any one of Claims 1 to 4, provided with printing means for presenting information corresponding to said temperature-sensed data.
6. Apparatus as claimed in any one of Claims 1 to 5, in combination with a station operable to receive said radio signals.
7. The combination claimed in Claim 6, wherein said station is ground-based.
8. Apparatus as claimed in any one of Claims 1 to 6, substantially as hereinbefore described with reference to the accompanying drawing.
9. The combination of Claim 7, substantially as hereinbefore described with reference to the accompanying drawing.



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Claims searched: All

Examiner: Gareth Griffiths  
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## Patents Act 1977 Search Report under Section 17

### Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): H4D (DPBC, DAB), H4L (LDGX, LDPPX, LECY, LETD, LETXX, LEUX, LRAX)

Int Cl (Ed.7): G01S 5/00, 5/14, G07C 5/00, G08B 25/10, G08G 1/127

Other: Online Databases: WPI, EPODOC, JAPIO

### Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	WO99/31575 A1 (KHAWAM) whole document	1-4, 6, 7 at least
X	US6072396 (GAUKEL) col.8 lines 5-22	1, 2, 4, 6, 7 at least
X	US5771001 (COBB) col.3 line 44 - col.4 line 57	1-4, 6, 7 at least
X	JP11296795 A (MITSUBISHI) see WPI/PAJ abstracts	1, 2, 4, 6, 7 at least
X	JP11088546 A (NEC) see WPI/PAJ abstracts	1, 2, 6, 7 at least
X	JP8228401 A (MITSUBISHI) see WPI/PAJ abstracts	1, 2, 4, 6, 7 at least
X	DE29708097 (WALTER) see WPI abstract	1, 2, 4, 6, 7 at least

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